? d s
Set Items Description
S1 1911725 S MRI OR MAGNETIC(1W)(IMAG? OR IMAGING) OR MAGNETIC(W)RESONAN? OR NMR OR NUCLEAR()MAGNETIC()RESONANCE OR FTNMR OR FTMRI
S2 178391 S MAGNETORESONANCE OR PMR OR PROTON(W)MAGNETIC(W)RESONAN? OR MR()(IMAGE? OR IMAGING)
S3 7517 S MC=(S01-E02A2 OR S03-E07A OR S01-E02A8A OR S01-E02A1 OR S03-E07C OR S05-D02B1 OR S03-C02F1)
S4 49299 IC=(G01R-003 OR G01N-024/08 OR G01V-003/A75 OR G01R-033/56F OR G01V-003/00) FROM 2, 155, 5, 6, 8, 73, 94, 35, 144, 105, 99, 58, 34, 434, 292, 89, 65, 360, 239, 347, 305, 350, 162, 164, 357, 315, 23, 46, 68, 60, 33, 335, 294
S5 22261 S CC=(A0758 OR A8760I OR B7510N)
S6 1985792 S S1:S5
S7 13479 S MECHANICAL(2N)OSCILLAT?
S8 44 S STATE?(3N)VOXEL?
S9 441451 S NON()LINEAR?
S10 662434 S DISTORT??????
S11 2878 S ELASTO()GRAPH? OR ELASTOGRAPH?
S12 124 S S6 AND S7
S13 0 S S8 AND S12
S14 7 S S12 AND S11
S15 5 RD (unique items)
S16 122 S S9 AND S10 AND S6
S17 1 S S16 AND (S7 OR S8 OR S11)
S18 0 S S11 AND S7 AND S16
S19 0 S S11 AND S7 AND S9 AND S10
S20 10504 S S9 AND S10
S21 2 S S20 AND S11
S22 1 S S21 NOT S17
S23 622 S S11 AND S6
S24 8 S S23 AND (S7 OR S20)
S25 2 S S24 NOT (S15 OR S17)
S26 1 RD (unique items)
S27 0 S S23 AND VARIAT?(3N)TIM????
S28 9 S S23 AND S10
S29 5 RD (unique items)
S30 0 S S20 AND S12
S31 3788 S S9(2N)S10
S32 33 S S31 AND S6
S33 21 RD (unique items)
S34 20 S S33 NOT (S15 OR S17 OR S21 OR S22 OR S29)

? show files

[File 2] **INSPEC** 1969-2005/Sep W3

[File 155] **MEDLINE(R)** 1951-2005/Sep 27

[File 5] **Biosis Previews(R)** 1969-2005/Sep W4

[File 6] **NTIS** 1964-2005/Sep W3

[File 8] **Ei Compendex(R)** 1970-2005/Sep W3

[File 73] **EMBASE** 1974-2005/Sep 28

[File 94] **JICST-EPlus** 1985-2005/Jul W5

[File 35] **Dissertation Abs Online** 1861-2005/Aug

[File 144] **Pascal** 1973-2005/Sep W3

[File 105] **AESIS** 1851-2001/Jul

**File 105: This file is closed (no updates)*

[File 99] **Wilson Appl. Sci & Tech Abs** 1983-2005/Jul

[File 58] **GeoArchive** 1974-2005/Jun

[File 34] **SciSearch(R) Cited Ref Sci** 1990-2005/Sep W3

[File 434] **SciSearch(R) Cited Ref Sci** 1974-1989/Dec

[File 292] **GEOBASE(TM)** 1980-2005/Aug B1

[File 89] **GeoRef** 1785-2005/Sep B1

**File 89: Please see HELP ALERTALL for new Alert frequency and price. Please see HELP RATES 89 for new Academic Subscriber rates.*

[File 65] **Inside Conferences** 1993-2005/Sep W4

[File 360] **Specialty Chemicals Update Program** 2000/Q2

**File 360: Full fmts cost $85.00 each for TYPEs, DISPLAYs, & PRINTs. Fmt 7 costs $50.00. SCUP subscribers - use F960. Updating suspended.*

[File 239] **Mathsci** 1940-2005/Nov

17/9/1 (Item 1 from file: 350) **Links**
Derwent WPIX

015619236 **Image available**
WPI Acc No: 2003-681407/200365
XRPX Acc No: N03-544012

Magnetic resonance elastography for detection of different tissue types, e.g. malignant lesions, whereby a patient or part of a patient is subject to mechanical vibrations and the resulting non-linear distortions evaluated

Patent Assignee: PHILIPS INTELLECTUAL PROPERTY GMBH (PHIG); KONINK PHILIPS ELECTRONICS NV (PHIG); SINKUS R (SINK-I); WEISS S (WEIS-I)
Inventor: SINKUS R; WEISS S
Number of Countries: 103 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 10209257	A1	20030911	DE 10209257	A	20020301	200365	B
WO 200373933	A1	20030912	WO 2003IB757	A	20030226	200370	
AU 2003248594	A1	20030916	AU 2003248594	A	20030226	200430	
EP 1482833	A1	20041208	EP 2003743465	A	20030226	200480	
			WO 2003IB757	A	20030226		
US 20050104588	A1	20050519	WO 2003IB757	A	20030226	200534	
			US 2004506456	A	20040831		
JP 2005518857	W	20050630	JP 2003572458	A	20030226	200543	
			WO 2003IB757	A	20030226		

Priority Applications (No Type Date): DE 10209257 A 20020301
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 10209257	A1		10	G01N-003/32	
WO 200373933	A1	E		A61B-005/055	
Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW				
Designated States (Regional): AT BE BG CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IT KE LS LU MC MW MZ NL OA PT SD SE SI SK SL SZ TR TZ UG ZM ZW					
AU 2003248594	A1			A61B-005/055	Based on patent WO 200373933
EP 1482833	A1	E		A61B-005/055	Based on patent WO 200373933
Designated States (Regional): AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LI LT LU LV MC MK NL PT RO SE SI SK TR					
US 20050104588	A1			G01V-003/00	
JP 2005518857	W		13	A61B-005/055	Based on patent WO 200373933

Abstract (Basic): DE 10209257 A1

NOVELTY - Object examination method has the following steps: excitation of the object with mechanical vibrations; measurement of the temporal behavior of object voxels that are displaced by waves in the

objects caused by the vibrations; determination of **non-linear distortion** from the temporal behavior of the deflections; and evaluation of the **non-linear distortions.**

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are included for:
(1) arrangement for implementation of the method;
(2) a computer program for use with a **magnetic resonance** instrument to implement the method.

USE - **Magnetic resonance elastography** for detection of different tissue types, e.g. malignant lesions.

ADVANTAGE - The inventive method yields additional information that enables better differentiation between tissue types.

DESCRIPTION OF DRAWING(S) - Figure shows a sequence of vibrations for use with MR data acquisition.

pp; 10 DwgNo 4/6

Title Terms: MAGNETIC; RESONANCE; DETECT; TISSUE; TYPE; MALIGNANT; LESION; PATIENT; PART; PATIENT; SUBJECT; MECHANICAL; VIBRATION; RESULT; NON; LINEAR; **DISTORT**; EVALUATE

Derwent Class: P31; S01; S03; S05; T01

International Patent Class (Main): A61B-005/055; G01N-003/32; **G01V-003/00**

International Patent Class (Additional): A61B-008/08; G01M-007/00; **G01R-033/28**

File Segment: EPI; EngPI

Manual Codes (EPI/S-X): **S01-E02A2**; **S03-E07A**; S05-D01J; S05-D02B2; T01-J06A; T01-S03

22/9/1 (Item 1 from file: 34) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
SciSearch(R) Cited Ref Sci

10385045 **Genuine Article#:** 521LE **Number of References:** 38
Advances in ultrasound

Author: Claudon M (REPRINT) ; Tranquart F; Evans DH; Lefevre F; Correas JM
Corporate Source: Univ Nancy,F-54511 Vandoeuvre Les Nancy//France/ (REPRINT); Univ Nancy,F-54511 Vandoeuvre Les Nancy//France/; Univ Tours,F-37044 Tours//France/; Univ Leicester,Leicester LE1 5WW/Leics/England/; Univ Paris Necker,F-75730 Paris//France/; Hop Enfants,Serv Radiol,F-54511 Vandoeuvre Les Nancy//France/
Journal: EUROPEAN RADIOLOGY , 2002 , V 12 , N1 (JAN) , P 7-18
ISSN: 0938-7994 **Publication date:** 20020100
Publisher: SPRINGER-VERLAG , 175 FIFTH AVE, NEW YORK, NY 10010 USA
Language: English **Document Type:** ARTICLE
Geographic Location: France; England
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING
Abstract: Significant advances have been recently introduced into various fields of technology, taking advantage of the use of new piezoelectric materials and the large diffusion of broadband transducers. Various types of modulation may be applied to the pulse characteristics, using single pulse, multipulse or multiline techniques, and resulting in improved spatial resolution and better penetration. **Non-linear** imaging uses the harmonics component, which is generated by tissues or by contrast agents. Different modalities can be used to separate harmonics from fundamental bands from the received signal. New Doppler modes have been developed, whereas grey-scale flow imaging allows the simultaneous imaging of blood flow and tissues. Compounding techniques improve the contrast resolution of tissues and reduce artefacts. If 3D techniques are now currently available, real-time 4D imaging has been recently introduced. **Elastographic** imaging is still under evaluation, but promising clinical results have been shown. Recent release of the DICOM specification has made the full integration of ultrasound to the PALS systems easier. All these advances indicate that the contribution and potential of ultrasound in patient management is still growing.
Descriptors--Author Keywords: US ; technology ; Doppler modes
Identifiers-- KeyWord Plus(R): BLOOD-FLOW; B-FLOW; NONLINEARITY; PROPAGATION; TRANSDUCERS; **DISTORTION**; PROSTATE
Cited References:
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BEGA G, 2000, V22, P13, DIAGN IMAGING S
BERSON M, 1999, V10, P53, EUR J ULTRASOUND
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WHITTINGHAM TA, 1999, V9, PS298, EUR RADIOL S3
WHITTINGHAM TA, 1999, V9, PS307, EUR RADIOL S3
WHITTINGHAM TA, 1999, V9, PS323, EUR RADIOL S3

26/9/1 (Item 1 from file: 73) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
EMBASE

12769467 **EMBASE No:** 2004360821
MR elastography of the prostate: Initial in-vivo application

Kemper J.; Sinkus R.; Lorenzen J.; Nolte-Ernsting C.; Stork A.; Adam G.
Dr. J. Kemper, Klin. Diagn. und Interventionelle R., Universtatsklinikum Eppendorf (UKE), Martinistr. 52, 20246 Hamburg Germany
Author Email: jkemper@uke.uni-hamburg.de
RoFo Fortschritte auf dem Gebiet der Rontgenstrahlen und der Bildgebenden Verfahren (ROFO FORTSCHR. GEB. RONTGENSTR. BILDGEBENDEN VERFAHREN) (Germany) 2004 , 176/8 (1094-1099)
CODEN: RFGVE **ISSN:** 1438-9029
Document Type: Journal ; Article
Language: ENGLISH **Summary Language:** ENGLISH; GERMAN
Number Of References: 20

Purpose: To analyze the initial assessment of the technical feasibility of in-vivo MR **elastography** (MRE) of the prostate gland in healthy volunteers. Materials and Methods: Dynamic sinusoidal MR **elastography** was performed in 7 healthy volunteers in prone position. The mechanical wave was induced via an external oscillator attached to the pubic bone. A 1.5 Tesla MR system (Philips Medical Systems, Netherland) was used with 4 combined surface coils for signal reception. MRE data acquisition was performed with a motion-sensitive spin-echo MR sequence that was phase-locked to the **mechanical oscillation**. Subsequently, these images were used to reconstruct the local distribution of elasticity inside the prostate gland. The applied reconstruction algorithm was tested by means of phantom measurements. Results: Sufficient penetration of the mechanical wave into the prostate gland was achieved in all volunteers, allowing the acquisition of utilizable image data sets. The reconstructed distribution of elasticity (shear-modulus) inside the healthy prostate gland correlated with the zonal anatomy of the gland. The elasticity of the central portion (2.2 +/- 0.3 kPa) appeared to be lower than the peripheral prostatic portion (3.3 +/- 0.5 kPa). Conclusion: In-vivo MRE of the prostate gland is technically feasible. The proposed experimental set-up allows the efficient insertion of the mechanical wave into the prostate gland and provides a successful MR data acquisition.

Device Brand Name/Manufacturer Name: 1.5 Tesla MR system/Philips/Netherlands
Device Manufacturer Names: Philips/Netherlands
MEDICAL DESCRIPTORS:
*** elastography; *nuclear magnetic resonance imaging ; *prostatefeasibility stud**
feasibility study; oscillator; pubic bone; oscillation; image reconstruction; elasticity; in vivo study; human; male; human experiment; normal human; adult; article; priority journal
SECTION HEADINGS:
014 Radiology
028 Urology and Nephrology

29/9/1 (Item 1 from file: 2) **Links**

Fulltext available through: Institute of Electrical and Electronics Engineers USPTO Full Text Retrieval Options
INSPEC

08674628 **INSPEC Abstract Number:** A2003-16-8760I-012, B2003-08-7510N-047

Title: Measurement of in vivo local shear modulus using MR elastography multiple-phase patchwork offsets

Author Suga, M.; Matsuda, T.; Minato, K.; Oshiro, O.; Chihara, K.; Okamoto, J.; Takizawa, O.; Komori, M.; Takahashi, T.

Author Affiliation: Graduate Sch. of Inf. Sci., Nara Inst. of Sci. & Technol., Japan

Journal: IEEE Transactions on Biomedical Engineering vol.50, no.7 p. 908-15

Publisher: IEEE ,

Publication Date: July 2003 **Country of Publication:** USA

CODEN: IEBEAX **ISSN:** 0018-9294

SICI: 0018-9294(200307)50:7L.908:MVLS;1-I

Material Identity Number: I050-2003-007

U.S. Copyright Clearance Center Code: 0018-9294/03/$17.00

Language: English **Document Type:** Journal Paper (JP)

Treatment: Theoretical (T)

Abstract: Magnetic resonance elastography (MRE) is a method that can visualize the propagating and standing shear waves in an object being measured. The quantitative value of a shear modulus can be calculated by estimating the local shear wavelength. Low-frequency mechanical motion must be used for soft, tissue-like objects because a propagating shear wave rapidly attenuates at a higher frequency. Moreover, a propagating shear wave is **distorted** by reflections from the boundaries of objects. However, the **distortions** are minimal around the wave front of the propagating shear wave. Therefore, we can avoid the effect of reflection on a region of interest (ROI) by adjusting the duration of mechanical vibrations. Thus, the ROI is often shorter than the propagating shear wavelength. In the MRE sequence, a motion-sensitizing gradient (MSG) is synchronized with mechanical cyclic motion. MRE images with multiple initial phase offsets can be generated with increasing delays between the MSG and mechanical vibrations. This paper proposes a method for measuring the local shear wavelength using MRE multiple initial phase patchwork offsets that can be used when the size of the object being measured is shorter than the local wavelength. To confirm the reliability of the proposed method, computer simulations, a simulated tissue study and in vitro and in vivo studies were performed. (17 Refs)

Descriptors: biomechanics; biomedical **MRI**; elastic moduli measurement; shear modulus

Identifiers: in vivo local shear modulus measurement; object boundaries; local wavelength; region of interest; mechanical vibrations duration; **magnetic resonance imaging**; medical diagnostic imaging; motion-sensitizing gradient; multiple initial phase patchwork offsets; in vivo human tissue; computer simulations; simulated tissue study; in vivo studies; in vitro studies

Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8745B (Mechanical properties of tissues and organs); A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); **B7510N** (Biomedical magnetic resonance imaging and spectroscopy); B7320G (Mechanical variables measurement

29/9/2 (Item 1 from file: 8) **Links**
Ei Compendex(R)

06930618 **E.I. No:** EIP04288254794
Title: Quantification of soft tissue deformations using strain-encoded magnetic resonance imaging

Author: Fahmy, Ahmed S.; Osman, Nael F.
Corporate Source: Electrical and Computer Engineering Johns Hopkins University, Baltimore, MD, United States
Conference Title: Medical Imaging 2004: Physiology, Function, and Structure from Medical Images
Conference Location: San Diego, CA, United States **Conference Date:** 20040215-20040217
Sponsor: SPIE
E.I. Conference No.: 63197
Source: Proceedings of SPIE - The International Society for Optical Engineering Medical Imaging 2004: Physiology, Function, and Structure from Medical Images v 5369 2004.
Publication Year: 2004
CODEN: PSISDG **ISSN:** 0277-786X
Language: English
Document Type: CA; (Conference Article) **Treatment:** T; (Theoretical)
Journal Announcement: 0407W2
Abstract: Strain Encoded **Magnetic Resonance Imaging** (SENC-**MRI**) is a new technique that allows real-time quantification of tissue deformation. The technique is based on initially modulating the magnetization of the imaged object with sinusoidal pattern (MR-tagging) in the z-direction (throughplane direction). Compression is then applied to the object resulting in a change of the frequency of the sinusoidal tagging depending, in part, on tissue stiffness; e.g. the softer the material the higher the resulting frequency. By determining the changes in frequency, regional deformations can be determined and quantified. In SENC **MRI**, this is achieved by acquiring several images (typically 8 images), each with different phase-encoding, which we call tunings, in the z-direction. For each tuning, the intensity of pixels whose tagging frequency coincides with the tuning frequency is higher than other pixels. Since the number of the acquired images is limited, only a limited range of frequencies can be covered and, hence, the accuracy of the estimates may be inefficient if the tuning are not selected carefully. However, in this paper, we show that deformation maps can be obtained with good accuracy from the limited number of tunings. In this regard, we propose three methods and compare between them for maximum achievable accuracy. The methods are 1) center-of-mass, 2.) curve fitting, and 3) clustering-based method. The methods are applied to simulated data and **MR images** obtained from a gel phantom experiment. The results of comparisons shows that good estimates of deformation can be obtained even if the sampled data is **distorted** by noise or MR artifacts. 15 Refs.
Descriptors: ***Magnetic resonance imaging**; Tissue; Tumors; Elastic moduli; Magnetization; Curve fitting; Sensitivity analysis; Parameter estimation; Mathematical models
Identifiers: Strain encoded imaging; Tissue deformation; Tissue stiffness; **Elastography**
Classification Codes:
701.2 (Magnetism, Basic Concepts & Phenomena); 461.2 (Biological Materials); 921.6 (Numerical Methods); 731.1 (Control Systems)
701 (Electricity & Magnetism); 461 (Bioengineering); 921 (Applied Mathematics); 731 (Automatic Control Principles & Applications)
70 (ELECTRICAL ENGINEERING, GENERAL); 46 (BIOENGINEERING); 92 (ENGINEERING MATHEMATICS); 73 (CONTROL ENGINEERING)

29/9/3 (Item 2 from file: 8) **Links**
Fulltext available through: Institute of Electrical and Electronics Engineers USPTO Full Text Retrieval Options
Ei Compendex(R)

06873611 **E.I. No:** EIP04228189306
Title: Supersonic shear imaging: A new technique for soft tissue elasticity mapping

Author: Bercoff, Jeremy; Tanter, Mickael; Fink, Mathias
Corporate Source: Laboratoire Ondes et Acoustique Ecl. Sup. de Phys./de Chim. Indust. Universite Paris VII, 75005, Paris, France
Source: IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control v 51 n 4 April 2004. p 396-409
Publication Year: 2004
CODEN: ITUCER **ISSN:** 0885-3010
Language: English
Document Type: JA; (Journal Article) **Treatment:** T; (Theoretical)
Journal Announcement: 0406W2
Abstract: Supersonic shear imaging (SSI) is a new ultrasound-based technique for real-time visualization of soft tissue viscoelastic properties. Using ultrasonic focused beams, it is possible to remotely generate mechanical vibration sources radiating low-frequency, shear waves inside tissues. Relying on this concept, SSI proposes to create such a source and make it move at a supersonic speed. In analogy with the "sonic boom" created by a supersonic aircraft, the resulting shear waves will interfere constructively along a Mach cone, creating two intense plane shear waves. These waves propagate through the medium and are progressively **distorted** by tissue heterogeneities. An ultrafast scanner prototype is able to both generate this supersonic source and image (5000 frames/s) the propagation of the resulting shear waves. Using inversion algorithms, the shear elasticity of medium can be mapped quantitatively from this propagation movie. The SSI enables tissue elasticity mapping in less than 20 ms, even in strongly viscous medium like breast. Modalities such as shear compounding are implementable by tilting shear waves in different directions and improving the elasticity estimation. Results validating SSI in heterogeneous phantoms are presented. The first in vivo investigations made on healthy volunteers emphasize the potential clinical applicability of SSI for breast cancer detection. 16 Refs.
Descriptors: *Imaging systems; Tissue; Elasticity; Shear waves; **Magnetic resonance imaging**; Vibrations (mechanical); Acoustics; Algorithms; Mathematical models
Identifiers: Supersonic shear imaging; Soft tissue elasticity mapping; **Elastography**; Breast cancer
Classification Codes:
723.2 (Data Processing); 461.2 (Biological Materials); 931.1 (Mechanics) ; 701.2 (Magnetism, Basic Concepts & Phenomena)
723 (Computer Software, Data Handling & Applications); 461 (Bioengineering); 421 (Strength of Building Materials; Mechanical Properties); 931 (Applied Physics Generally); 701 (Electricity & Magnetism); 751 (Acoustics, Noise & Sound); 921 (Applied Mathematics)
72 (COMPUTERS & DATA PROCESSING); 46 (BIOENGINEERING); 42 (BUILDING MATERIALS PROPERTIES & TESTING); 93 (ENGINEERING PHYSICS); 70 (ELECTRICAL ENGINEERING, GENERAL); 75 (SOUND & ACOUSTICAL TECHNOLOGY); 92 (ENGINEERING MATHEMATICS)

29/9/4 (Item 3 from file: 8) **Links**
Fulltext available through: USPTO Full Text Retrieval Options

05654705 **E.I. No:** EIP00095338205
Title: Tissue mechanical attributes imaging: principles and methods

Author: Kallel, Faouzi; Ophir, Jonathan
Corporate Source: Univ of Texas Medical Sch, Houston, TX, USA
Conference Title: CBMS 2000: 13th IEEE Sympoisum on Computer-Based Medical Systems
Conference Location: Houston, TX, USA **Conference Date:** 19000622-19000624
Sponsor: IEEE
E.I. Conference No.: 57265
Source: Proceedings of the IEEE Symposium on Computer-Based Medical Systems 2000. IEEE, Los Alamitos, CA, USA. p 147-159
Publication Year: 2000
CODEN: PSCSFM **ISSN:** 1063-7125
Language: English
Document Type: CA; (Conference Article) **Treatment:** T; (Theoretical)
Journal Announcement: 0010W4
Abstract: We review the principles of MR and ultrasonic approaches proposed for imaging the mechanical attributes or properties of tissues. We identify two groups of methods. One group of methods is based on the use of applied vibration to obtain information about tissue mechanical properties. The second group of methods is based on the application of quasi-static compression as a stimulus to map distribution of tissue mechanical attributes. Appropriate theoretical models are presented to explain both groups of methods. Finally, the principles of **elastography** are detailed with emphasis on its potential clinical applications. (Author abstract) 37 Refs.
Descriptors: *Medical imaging; Tissue; **Magnetic resonance imaging**; Ultrasonic imaging; Mathematical models; Acoustic waves; Signal **distortion**; Ultrasonic refraction
Identifiers: Tissue mechanical attributes imaging; Applied vibration; Quasi states compression; Stimulus; Map distribution; **Elastography**; Clinical applications
Classification Codes:
461.1 (Biomedical Engineering); 461.2 (Biological Materials); 701.2 (Magnetism: Basic Concepts & Phenomena); 753.3 (Ultrasonic Applications); 921.6 (Numerical Methods); 751.1 (Acoustic Waves)
461 (Biotechnology); 701 (Electricity & Magnetism); 753 (Sound Technology & Ultrasonics); 921 (Applied Mathematics); 751 (Acoustics)
46 (BIOENGINEERING); 70 (ELECTRICAL ENGINEERING); 75 (ACOUSTICAL TECHNOLOGY); 92 (ENGINEERING MATHEMATICS)

34/9/1 (Item 1 from file: 2) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
INSPEC

08178324 **INSPEC Abstract Number:** A2002-06-0758-006, B2002-03-7510N-047, C2002-03-5260B-441
Title: Non-linear compensation of distortions introduced by the presence of metal objects in magnetic resonance imaging
Author Bui, F.M.; Bott, K.; Mintchev, M.P.
Author Affiliation: Dept. of Electr. & Comput. Eng., Calgary Univ., Alta., Canada
Journal: Proceedings of the SPIE - The International Society for Optical Engineering **Conference Title:** Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.4322, pt.1-3 p. 845-52
Publisher: SPIE-Int. Soc. Opt. Eng ,
Publication Date: 2001 **Country of Publication:** USA
CODEN: PSISDG **ISSN:** 0277-786X
SICI: 0277-786X(2001)4322:1/3L.845:LCDI;1-4
Material Identity Number: C574-2001-256
U.S. Copyright Clearance Center Code: 0277-786X/01/$15.00
Conference Title: Medical Imaging 2001: Image Processing
Conference Sponsor: SPIE
Conference Date: 19-22 Feb. 2001 **Conference Location:** San Diego, CA, USA

Language: English **Document Type:** Conference Paper (PA); Journal Paper (JP)
Treatment: Practical (P)
Abstract: Magnetic resonance imaging (**MRI**) exhibits technical characteristics that make it invaluable in medical diagnosis. However, its full potential has been severely limited by the presence of imaging artifacts. These artifacts cause distortions in the obtained images, which no longer faithfully represent the object being imaged. In this work, we study the particular type of artifact known as "magnetic susceptibility difference artifacts", caused by the presence of a ferromagnetic source. Previously (2000), we have quantified these artifacts from three different perspectives: (1) pixel displacement, (2) blurring and (3) nonlinearity. However, the nonlinear distortions were quantified using a single-parameter nonlinear function. In this study, a multi-parameter nonlinear function based on polynomial series is used in the optimization. The results show that this modification allows for more flexibility and, as a result, improves the optimization algorithm. (25 Refs)
Descriptors: error compensation; ferromagnetic materials; image processing; **magnetic resonance imaging**; magnetic susceptibility; metals; nonlinear distortion; optimisation; series (mathematics
Identifiers: nonlinear distortion compensation; metal objects; **magnetic resonance imaging**; **MRI**; medical diagnosis; imaging artifacts; magnetic susceptibility difference artifacts; ferromagnetic source; pixel displacement; blurring; multi-parameter nonlinear function; polynomial series; optimization algorithm; flexibility; digital image processing; Taylor's series expansion; nonlinear signal processing
Class Codes: A0758 (Magnetic resonance spectrometers, auxiliary instruments and techniques); A7530C (Magnetic moments and susceptibility in magnetically ordered materials); A4230V (Image processing and restoration); **A8760I** (Medical magnetic resonance imaging and spectroscopy); **B7510N** (Biomedical magnetic resonance imaging and spectroscopy); B3110C (Ferromagnetic materials); B0260 (Optimisation techniques); B6135 (Optical, image and video signal processing); C5260B (Computer vision and image processing techniques); C1180 (Optimisation techniques); C7330 (Biology and medical computing

34/9/2 (Item 2 from file: 2) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
INSPEC

08000118 **INSPEC Abstract Number:** A2001-18-8760I-001, B2001-09-7510N-076, C2001-09-7330-286
Title: Volterra series modelling and compensation of non- linear distortions caused by susceptibility difference artefacts related to the presence of ferromagnetic implants in magnetic resonance imaging
Author Bui, F.M.; Jianchuan Li; Bott, K.; Mintchev, M.P.
Author Affiliation: Dept. of Electr. Eng., Calgary Univ., Alta., Canada
Journal: Medical Engineering & Physics vol.23, no.3 p. 207-15
Publisher: Elsevier ,
Publication Date: April 2001 **Country of Publication:** UK
CODEN: MEPHEO **ISSN:** 1350-4533
SICI: 1350-4533(200104)23:3L.207:VSMC;1-N
Material Identity Number: B478-2001-007
U.S. Copyright Clearance Center Code: 1350-4533/2001/$20.00
Document Number: S1350-4533(01)00044-3
Language: English **Document Type:** Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)
Abstract: Magnetic resonance imaging is popular in medical settings due to its unique technical characteristics. However, its full potential has been limited by imaging artefacts caused by various phenomena. Previously, a methodology was proposed to characterize and reduce artefacts caused specifically by magnetic susceptibility differences. In the present work, the Volterra series approach is suggested as an alternative method for describing **non- linear distortions** induced by susceptibility artefacts. A second-order Volterra series is utilized for characterizing the image non-linearities using a block-by-block processing approach. Subsequently, a corresponding second-order inverse Volterra series is applied to compensate for the quantified distortions. In addition, a technique for automatic demarcation of recoverable and non-recoverable regions in **magnetic resonance images** is proposed to ameliorate the developed methodology. Experimental results indicate that this approach offers improved accuracy and flexibility in reducing nonlinear distortions caused by magnetic susceptibility artefacts. (27 Refs)
Descriptors: biomedical **MRI**; magnetic susceptibility; medical image processing; modelling; prosthetics; Volterra series
Identifiers: Volterra series modelling; nonlinear distortions compensation; ferromagnetic implants; medical **magnetic resonance imaging**; nonlinear distortions; block-by-block processing approach; medical diagnostic imaging; second-order inverse Volterra series; nonrecoverable regions; recoverable regions; nonlinear system identification; digital image processing
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8740 (Biomagnetism); A8770J (Prosthetics and other practical applications); A8770E (Patient diagnostic methods and instrumentation); A8710 (General, theoretical, and mathematical biophysics); **B7510N** (Biomedical magnetic resonance imaging and spectroscopy); B7520E (Prosthetics and orthotics); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques

34/9/3 (Item 3 from file: 2) **Links**
INSPEC

07630850 **INSPEC Abstract Number:** A2000-15-8760I-050, B2000-08-7510N-072, C2000-08-7330-163
Title: Multiresolution spline warping for EPI registration
Author Kybic, J.; Thevenaz, P.; Unser, M.
Author Affiliation: Biomed. Imaging Group, Swiss Fed. Inst. of Technol., Lausanne, Switzerland
Journal: Proceedings of the SPIE - The International Society for Optical Engineering **Conference Title:** Proc. SPIE - Int. Soc. Opt. Eng. (USA) vol.3813 p. 571-9
Publisher: SPIE-Int. Soc. Opt. Eng ,
Publication Date: 1999 **Country of Publication:** USA
CODEN: PSISDG **ISSN:** 0277-786X
SICI: 0277-786X(1999)3813L.571:MSWR;1-O
Material Identity Number: C574-1999-324
U.S. Copyright Clearance Center Code: 0277-786X/99/$10.00
Conference Title: Wavelet Applications in Signal and Image Processing VII
Conference Sponsor: SPIE
Conference Date: 19-23 July 1999 **Conference Location:** Denver, CO, USA

Language: English **Document Type:** Conference Paper (PA); Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: Registration of images subject to non-linear warping has numerous practical applications. We present an algorithm based on double multiresolution structure of warp and image spaces. Tuning a so-called scale parameter controls the coarseness of the grid by which the deformation is described and also the amount of implicit regularization. The application of our algorithm deals with undoing unidirectional **non- linear** geometrical **distortion** of echo-planar images (EPI) caused by local magnetic field inhomogeneities induced mainly by the subject presence. The unwarping is based on registering the EPI images with corresponding undistorted anatomical **MRI** images. We present evaluation of our method using a wavelet-based random Sobolev-type deformation generator as well as other experimental examples. (25 Refs)
Descriptors: biomedical **MRI**; brain; image registration; image resolution; medical image processing; splines (mathematics
Identifiers: multiresolution spline warping; EPI registration; nonlinear warping; double multiresolution structure; image spaces; scale parameter; grid coarseness; regularization; unidirectional nonlinear geometrical distortion; echo-planar images; local magnetic field inhomogeneities; subject presence; wavelet-based random Sobolev-type deformation generator
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); **B7510N** (Biomedical magnetic resonance imaging and spectroscopy); B6135 (Optical, image and video signal processing); B0290F (Interpolation and function approximation (numerical analysis)); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques); C4130 (Interpolation and function approximation (numerical analysis

34/9/4 (Item 4 from file: 2) **Links**
INSPEC

07497845 **INSPEC Abstract Number:** A2000-06-8760I-007, B2000-03-7510N-082, C2000-03-7330-300
Title: Method for partial reduction of the non-linearity and distortion in MR images caused by the presence of metal objects
Author Domoustchiev, K.; Bott, K.; Smith, M.R.; Mintchev, M.P.
Author Affiliation: Dept. of Electr. & Comput. Eng., Calgary Univ., Alta., Canada
Conference Title: Engineering Solutions for the Next Millennium. 1999 IEEE Canadian Conference on Electrical and Computer Engineering (Cat. No.99TH8411) **Part** vol.2 p. 851-4 vol.2
Editor(s): Meng, M.
Publisher: IEEE , Piscataway, NJ, USA
Publication Date: 1999 **Country of Publication:** USA 3 vol. (xxiii+1758) pp.
ISBN: 0 7803 5579 2 **Material Identity Number:** XX-1999-02873
U.S. Copyright Clearance Center Code: 0 7803 5579 2/99/$10.00
Conference Title: Engineering Solutions for the Next Millennium. 1999 IEEE Canadian Conference on Electrical and Computer Engineering
Conference Date: 9-12 May 1999 **Conference Location:** Edmonton, Alta., Canada

Language: English **Document Type:** Conference Paper (PA)
Treatment: Practical (P); Theoretical (T); Experimental (X)
Abstract: Some of the major problems in **magnetic resonance imaging** are related to static artifacts generated through interactions with the main magnetic field. The artifacts caused by biomedical implants such as orthopedic braces, prostheses or other fixation device implants distort the information contained in the image and impair the process of clinical investigation. In this paper we present preliminary results of a non-linear adjustive method for partial reduction of such type of distortion. (5 Refs)
Descriptors: biomedical **MRI**; correlation methods; medical image processing; orthopaedics; prosthetics
Identifiers: metal objects; **MR images**; nonlinearity partial reduction; distortion partial reduction; **magnetic resonance imaging**; static artifacts; main magnetic field; biomedical implants; orthopedic braces; prostheses; fixation device implants; clinical investigation; nonlinear adjustive method; cross correlation coefficients
Class Codes: A8760I (Medical magnetic resonance imaging and spectroscopy); A8770E (Patient diagnostic methods and instrumentation); A8740 (Biomagnetism); A8770J (Prosthetics and other practical applications); **B7510N** (Biomedical magnetic resonance imaging and spectroscopy); B7520E (Prosthetics and orthotics); B6135 (Optical, image and video signal processing); C7330 (Biology and medical computing); C5260B (Computer vision and image processing techniques

34/9/5 (Item 1 from file: 155) **Links**
Fulltext available through: USPTO Full Text Retrieval Options

15368296 **PMID:** 15179281

[Imaging for stereotaxic treatment of vestibular schwannomas. Error factors and corrections]

Imagerie pour le traitement stereotaxique des schwannomes vestibulaires. Facteurs d'erreur et corrections.

Wikler D; Metens T; David P; Levivier M
Centre Gamma Knife, Hopital Erasme, Universite Libre de Bruxelles. David.Wikler@ulb.ac.be

Neuro-Chirurgie (France) Jun 2004 , 50 (2-3 Pt 2) p282-8 , **ISSN:** 0028-3770 **Journal Code:** 0401057
Publishing Model Print
Document type: Journal Article ; English Abstract
Languages: FRENCH
Main Citation Owner: NLM
Record type: MEDLINE; Completed
Subfile: INDEX MEDICUS

BACKGROUND AND PURPOSE: Gamma Knife radiosurgery treatment of vestibular schwannomas requires high accuracy for the prescribed dose definition and delivery. The main factors contributing to the error are the anatomical distortions of imaging modalities used for treatment planning. Imaging limitations and error factors are reviewed and detailed. Multimodality rationale for the delineation of vestibular schwannomas and surrounding structures are assessed. Quality control strategies are discussed and a distortion correction technique using a radiological phantom is presented. METHODS: Computed tomography is considered as the reference for spatial accuracy after appropriate scanner quality control using the stereotaxic fiducials system. **Magnetic resonance imaging** pulse sequence distortions are measured with a phantom designed for 3D **non-linear** local **distortion** evidence. A distortion correction transformation is computed from the phantom images and applied to the patient images. Results are verified using the stereotaxic fiducials system. RESULTS: Fiducials registration errors show spatial accuracy improvement, approaching computed tomography quality, after distortion correction of **magnetic resonance images**. CONCLUSIONS: The multimodal imaging approach for the dose planning of vestibular schwannomas radiosurgery treatment is relevant. Quality control of spatial accuracy for imaging modalities is mandatory and realistic in clinical routine.

Descriptors: *Ear Neoplasms--surgery--SU; *Neuroma, Acoustic--surgery--SU; *Postoperative Complications--prevention and control--PC; *Radiosurgery --instrumentation--IS ; Ear Neoplasms--pathology--PA; Ear Neoplasms--radiography--RA; Humans; **Magnetic Resonance Imaging**; Neuroma, Acoustic--pathology--PA; Neuroma, Acoustic--radiography--RA; Tomography, X-Ray Computed
Record Date Created: 20040604
Record Date Completed: 20040826

34/9/6 (Item 1 from file: 8) **Links**
Ei Compendex(R)

07457032 **E.I. No:** EIP05259165253
Title: Motion correction in fMRI by mapping slice-to-volume with concurrent field-inhomogeneity correction

Author: Yeo, Desmond T. B.; Fessier, Jeffery A.; Kim, Boklye
Conference Title: Medical Image Computing and Computer-Assisted Intervention, MICCAI 2004 - 7th International Conference, Proceedings
Conference Location: Saint-Malo, France **Conference Date:** 20040926-20040929
E.I. Conference No.: 64990
Source: Lecture Notes in Computer Science Medical Image Computing and Computer-Assisted Intervention, MICCAI 2004 - 7th International Conference, Proceedings v 3217 n 1 PART 2 2004.
Publication Year: 2004
ISSN: 0302-9743
Language: English
Document Type: CA; (Conference Article) **Treatment:** T; (Theoretical)
Journal Announcement: 0505W5
Abstract: Head motion is the major source of error in measuring intensity changes related to given stimuli in fMRI. The effects of head motion are image shifts and field inhomogeneity variations which cause local changes in geometric distortions. The previously developed motion correction method, mapping slice-to-volume (MSV), retrospectively remaps slices that are shifted by head motion to their spatially correct locations in an anatomical reference. Images exhibiting spatially varying geometric **distortions** require **non-linear** mapping solutions. An accurate field map can be used for the correction of such spatial distortions. However, field-map changes with head motion and, in practice, only one field-map is available typically. This work evaluates the improved motion correction capability of MSV with concurrent iterative field-corrected reconstruction using only an initial field-map. The results from simulated motion data show effective convergence and accuracy in image registration for the correction of image artifacts complicated by the motion induced field effects. copy Springer-Verlag Berlin Heidelberg 2004. 7 Refs.
Descriptors: ***Magnetic resonance imaging**; Mapping ; Image analysis; Data reduction; Magnetic susceptibility; Brain; Computer simulation
Identifiers: Motion correction; Map-slice-to-volume (MSV); Image artifacts; Head motion
Classification Codes:
701.2 (Magnetism, Basic Concepts & Phenomena); 461.1 (Biomedical Engineering); 723.2 (Data Processing); 723.5 (Computer Applications)
701 (Electricity & Magnetism); 461 (Bioengineering); 741 (Light, Optics & Optical Devices); 723 (Computer Software, Data Handling & Applications)
70 (ELECTRICAL ENGINEERING, GENERAL); 46 (BIOENGINEERING); 74 (LIGHT & OPTICAL TECHNOLOGY); 72 (COMPUTERS & DATA PROCESSING)

34/9/7 (Item 1 from file: 35) Links
Dissertation Abs Online

01301938 ORDER NO: AADMM-74514

GEOMETRICAL DISTORTION OF MAGNETIC RESONANCE IMAGES

Author: GAUVIN, ALAIN
Degree: M.SC.
Year: 1992
Corporate Source/Institution: MCGILL UNIVERSITY (CANADA) (0781)
Source: Volume 31/03 of MASTERS ABSTRACTS. of Dissertations Abstracts International.
PAGE 1257 . 134 PAGES
Descriptors: PHYSICS, OPTICS; HEALTH SCIENCES, RADIOLOGY; ENGINEERING, BIOMEDICAL
Descriptor Codes: 0752; 0574; 0541
ISBN: 0-315-74514-2

The problem of geometrical distortion in **MR images** is addressed in the context of the applicability of stereotactic techniques. For this purpose, the distortion of phantom images is measured at various readout bandwidths and the spatial linearity is evaluated in view of the use of a stereotactic frame. The presence of a contribution to the overall **distortion** of **non- linear** magnetic gradients is shown from the data, although the distortion observed seems to be mostly attributable to the main field inhomogeneity. The specific problems of distortion of the fiducial markers due to bulk magnetic susceptibility effects is addressed. The occurrence of such effects is characterized with the help of imaging, and the role of the phenomenon on proper target localization is demonstrated. In addition, a method of bypassing the detrimental aspect of these effects is presented.

Various distortion correction approaches are discussed, and their benefits and drawbacks are evaluated. In the light of this discussion, a recently reported correction method is then presented. This method allows the calculation of an image free from geometrical and intensity distortion from the combined effect of main field inhomogeneity, susceptibility effects and chemical shift. (Abstract shortened by UMI.)

34/9/8 (Item 1 from file: 144) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
Pascal

14624300 PASCAL No.: 00-0294719

A quantitative study of the pixel-shifting, blurring and nonlinear distortions in **MRI** images caused by the presence of metal implants

BUI F M; BOTT K; MINTCHEV M P
Department of Electrical and Computer Engineering, University of Calgary, Calgary, Alberta, T2N 1N4, Canada; GE Medical Systems, Calgary, Alberta, T2N 1N4, Canada; Department of Surgery, University of Alberta, Edmonton, Alberta, T6G 2B7, Canada
Journal: Journal of medical engineering & technology
, 2000, 24 (1
) 20-27
ISSN: 0309-1902 CODEN: JMTEDN Availability: INIST-14682
; 354000088505300040
No. of Refs.: 20 ref.
Document Type: P (Serial) ; A (Analytic)
Country of Publication: United Kingdom
Language: English
Magnetic resonance imaging has found an increasing number of medical applications in recent years due to its technical merits as well as its non-invasive nature. However, its full potential has been severely limited by magnetic susceptibility difference artefacts caused by the presence of ferromagnetic sources such as orthopedic implants, dental work or metallic needles used in neurosurgery. In this study, we propose a method to numerically quantify the distortions resulting from the magnetic susceptibility differences by investigating the phenomena from three perspectives: (1) pixel displacement, (2) blurring and (3) nonlinearity. For this purpose, phantom images obtained from a **magnetic resonance** scanner were studied. Attempts made to reconstruct an ideal image from its distorted version by appropriately compensating for the three types of distortions yielded encouraging results.

English Descriptors: **Nuclear magnetic resonance imaging**; Interference; Implanted material; Surgery; Metal; Quantitative analysis; Image quality; **Non linear distortion**; Blurred image; Magnetic susceptibility; Test object
Broad Descriptors: Medical imagery; Imagerie medicale; Imageneria medical

French Descriptors: Imagerie RMN; Interference; Materiau implante; Chirurgie; Metal; Analyse quantitative; Qualite image; Distorsion non lineaire; Image floue; Susceptibilite magnetique; Objet test

Classification Codes: 002B24A10

34/9/9 (Item 1 from file: 34) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
SciSearch(R) Cited Ref Sci

10609119 **Genuine Article#:** 547BQ **Number of References:** 15
A patch algorithm for fast registration of distortions

Author: Zhilkin P (REPRINT) ; Alexander ME
Corporate Source: Natl Res Council Canada,Inst Biodiagnost,435 Ellice Ave/Winnipeg/MB R3B 1Y6/Canada/ (REPRINT); Natl Res Council Canada,Inst Biodiagnost,Winnipeg/MB R3B 1Y6/Canada/
Journal: VIBRATIONAL SPECTROSCOPY , 2002 , V 28 , N1 (FEB 28) , P 67-72
ISSN: 0924-2031 **Publication date:** 20020228
Publisher: ELSEVIER SCIENCE BV , PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS
Language: English **Document Type:** ARTICLE
Geographic Location: Canada
Journal Subject Category: CHEMISTRY, ANALYTICAL; CHEMISTRY, PHYSICAL; SPECTROSCOPY
Abstract: This note describes an algorithm for registration of **non- linear distortions** in two-dimensional (2D) images. The algorithm solves an integrated for-m of linearized image matching equation over a set of patches in the image domain. The distortion field is represented as a linear combination of multinomials in the image-plane coordinates. Prior to registration, the images are convolved with band-pass filters that are implemented at a coarse-to-fine hierarchy of spatial scales (specified at input by the user); and some heuristics are given for choosing these scales. Images registered at a coarse scale are used as input approximations for deriving images registered at a subsequent finer scale of resolution. With this prescribed hierarchy, the algorithm is non-iterative it is also robust to noise, and can in principle accommodate arbitrary local or global distortions. The results indicate that non-linear registration does improve the match between images. (C) 2002 Elsevier Science B.V. All rights reserved.
Descriptors--Author Keywords: image processing ; non-linear registration ; multiscale filtering
Identifiers-- KeyWord Plus(R): IMAGE REGISTRATION; **MR-IMAGES**
Cited References:
ALEXANDER ME, 1998, P2090, P 6 ISMRM
ALEXANDER ME, 1999, V10, P242, INT J IMAG SYST TECH
FRISTON KJ, 1995, V2, P165, HUMAN BRAIN MAPPING
GOLDSTEIN SR, 1997, V16, P17, IEEE T MED IMAGING
GUPTA N, 1997, V22, P81, INT J COMPUT VISION
HAJNAL JV, 1995, V19, P289, J COMPUT ASSIST TOMO
HILL DLG, 2001, V46, PR1, PHYS MED BIOL
HORN BKP, 1981, V17, P185, ARTIF INTELL
PRESS WH, 1992, NUMERICAL RECIPES C
RUECKERT D, 1999, V18, P712, IEEE T MED IMAGING
SIMONCELLI EP, 1994, P790, P ICIP 94 AUST TX
WOODS RP, 1998, V22, P141, J COMPUT ASSIST TOMO
ZHILKIN P, 2001, P120, P ISMRM GLASG SCOTL
ZHILKIN P, 1999, P128, P 7 ISMRM PHIL PA
ZHILKIN P, 2000, V18, P1143, MAGN RESON IMAGING

34/9/10 (Item 2 from file: 34) **Links**
Fulltext available through: John Wiley and Sons USPTO Full Text Retrieval Options
SciSearch(R) Cited Ref Sci

07766228 **Genuine Article#:** 206FQ **Number of References:** 21
MRI geometric distortion: A simple approach to correcting the effects of non-linear gradient fields

Author: Langlois S (REPRINT) ; Desvignes M; Constans JM; Revenu M
Corporate Source: ISMRA UNIV,GREYC, 6 BD MARECHAL JUIN/F-14050 CAEN//FRANCE/ (REPRINT)
Journal: JMRI-JOURNAL OF MAGNETIC RESONANCE IMAGING , 1999 , V 9 , N6 (JUN) , P 821-831
ISSN: 1053-1807 **Publication date:** 19990600
Publisher: JOHN WILEY & SONS INC , 605 THIRD AVE, NEW YORK, NY 10158-0012
Language: English **Document Type:** ARTICLE
Geographic Location: FRANCE
Subfile: CC CLIN--Current Contents, Clinical Medicine
Journal Subject Category: RADIOLOGY, NUCLEAR MEDICINE & MEDICAL IMAGING
Abstract: We present a method to correct intensity variations and voxel shifts caused by non-linear gradient fields in **magnetic resonance images**. The principal sources of distortion are briefly discussed, as well as the methods of correction currently in use. The implication of the gradient held non-linearities on the signal equations are described in a detailed way for the case of two- and three-dimensional Fourier imaging. A model of these non-linearities, derived from the geometry of the gradient coils, Is proposed and then applied in post-processing to correct any images regardless of the acquisition sequence. Initial position errors, as large as 4 mm (i.e,, four voxels of 1 x 1 x 1.4 mm(3)) before correction, are reduced to less than the voxel sizes after correction. (C) 1999 Wiley-Liss, Inc.
Descriptors--Author Keywords: **magnetic resonance imaging** ; image **distortion** correction ; **non-linear** gradient fields
Identifiers-- KeyWord Plus(R): **MAGNETIC-RESONANCE IMAGES**; ACCURACY
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HUGHES DG, 1992, V25, P167, MAGNET RESON MED
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MAURER CR, 1996, V20, P666, J COMPUT ASSIST TOMO
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SCHAD L, 1987, V11, P499, J COMPUT ASSIST TOMO
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SUMANAWEERA T, 1994, V31, P40, MAGNET RESON MED
SUMANAWEERA TS, 1994, V35, P1, NEUROSURGERY
SUN L, 1994, V31, P359, MAGNET RESON MED
VRE RM, 1990, P77, MAGNETIC RESONANCE S
WALTON L, 1996, V38, P170, NEUROSURGERY
WELLS WM, 1996, V15, P429, IEEE T MED IMAGING

ZHU XX, 1995, V4, P217, SOLID STATE NUCL MAG

34/9/11 (Item 1 from file: 89) **Links**
GeoRef

01631660 **Georef No.:** 89-54004
Title: Enhancing borehole image data on a high-resolution PC

Author: Wong, S. A.; Startzman, R. A.; Kuo, T. B.
Corporate Source: Tex. A&M Univ., College Station, TX, United States
Monograph Title: Proceedings; Petroleum computer conference
Author: Anonymous
Conference Title: Petroleum computer conference
Conference Location: San Antonio, TX, United States,
Conference Date: June 25-28, 1989
Publisher: Soc. Pet. Eng., Richardson, TX, United States
p. 37-48
Date: 1989
Country of Publication: United States
Refs.: 22
Document Type: Book; Conference document
Bibliographic Level: Analytic
Illustrations: illus. incl. 3 tables
Language: English
Descriptors: boreholes; computers; convolution; data processing; downhole methods; engineering geology; filters; geophysical methods; high-resolution methods; imagery; methods; microcomputers; **non-linear distortion; nuclear magnetic resonance**; pattern recognition; personal computers; petroleum engineering; reservoir properties; seismic methods; spectroscopy; well-logging
Section Headings: 30 (Engineering geology); 20 (Applied geophysics);
Georef Update: 1989

34/9/12 (Item 1 from file: 65) **Links**
Inside Conferences

03154131 **Inside Conference Item ID:** CN033417287
Method For Partial Reduction of the Non-linear and Distortion in MR Images Caused by the Presence of Metal Objects
Bott, K.; Mintchev, M.; Smith, M.; Domoustchiev, K.
Conference: Electrical and computer engineering; Engineering solutions for the next millennium - Canadian conference; 12th
CANADIAN CONFERENCE ON ELECTRICAL AND COMPUTER ENGINEERING , 1999; VOL 2 P: 851-854
IEEE, 1999
ISSN: 0840-7789 **ISBN:** 0780355792
Language: English **Document Type:** Conference Papers and programme
Editor: Meng, M.
Sponsor: IEEE Canada
Location: Edmonton, Canada
Date: May 1999 (199905) (199905)
British Library Item Location: 3019.445500
Note:
Also known as CCECE '99. IEEE cat no 99TH8411
Descriptors: electrical engineering; computer engineering; engineering; CCECE; IEEE

34/9/13 (Item 1 from file: 347) **Links**
JAPIO

05986411 **Image available**
METHOD OF MEASURING NONLINEAR DISTORTION

Pub. No.: 10-269511 [JP 10269511 A]
Published: October 09, 1998 (19981009)
Inventor: HONDA NAOKI
KOMAGINE TAKASHI
OUCHI KAZUHIRO
Applicant: AKITA PREF GOV [000000] (A Japanese Government or Municipal Agency), JP (Japan)
Application No.: 09-075652 [JP 9775652]
Filed: March 27, 1997 (19970327)
International Class: [6] G11B-005/09; G11B-005/09; **G01R-033/12**
JAPIO Class: 42.5 (ELECTRONICS -- Equipment); 46.2 (INSTRUMENTATION -- Testing)

ABSTRACT
PROBLEM TO BE SOLVED: To provide such a method of measuring nonlinear distortion of a digital record, as a phase distortion and an amplitude distortion can be measured separately with precision, a direction of a phase distortion is identified, and this measured phase distortion value can be used as a record pre-correction quantity.

SOLUTION: When a nonlinear distortion is measured at magnetic recording, this method is to provide a **non-linear distortion** measuring method by which phase distortion (.delta.) and amplitude distortion (r) are separated and also with precision, for example, in a phase distortion measurement, phase distortion quantity in a desired recording density is obtained with precision and also a direction of the distortion is obtained by directly precorrecting dibit part of a recording pattern for recording. Moreover, from this quantity, the amplitude distortion quantity (r) in the recording density can be calculated with precision. It is possible to use the pre-correction quantity used for the measurement then as an optimal pre-correction quantity for a control at a time of recording operation.

34/9/14 (Item 2 from file: 347) **Links**
JAPIO

03046345 **Image available**
PHASE DISTORTION CORRECTING METHOD IN MAGNETIC RESONANCE IMAGING DEVICE

Pub. No.: 02-021845 [JP 2021845 A]
Published: January 24, 1990 (19900124)
Inventor: MAEDA AKIRA
KASAMA TAKASHI
YOKOYAMA TETSUO
NISHIMURA HIROSHI
Applicant: HITACHI LTD [000510] (A Japanese Company or Corporation), JP (Japan)
HITACHI MICRO COMPUT ENG LTD [470864] (A Japanese Company or Corporation), JP (Japan)
HITACHI MEDICAL CORP [420143] (A Japanese Company or Corporation), JP (Japan)
Application No.: 63-170928 [JP 88170928]
Filed: July 11, 1988 (19880711)
International Class: [5] A61B-005/05; **G01R-033/28**
JAPIO Class: 28.2 (SANITATION -- Medical)
Journal: Section: C, Section No. 706, Vol. 14, No. 171, Pg. 12, April 03, 1990 (19900403)

ABSTRACT

PURPOSE: To lessen a large **non-linear** phase **distortion** of the whole complex image by setting an partial region (block) of an arbitrary form on a reconstructed complex image, and dividing the complex image into blocks.

CONSTITUTION: In a rotary recovery method which is one of imaging methods in the **magnetic resonance imaging**, image C'(sub 1k)=(C(sub 1k))(sup 2) where reconstructed image containing phase distortion is squared is calculated. An absolute value for C'(sub 1k) is taken and the maximum value (CMAX) is calculated. C'(sub 1k) is divided into blocks C'(sub mn)o. The size of the block is decided so that the change of the phase distortion is kept within the range of plus or minus .pi. if possible. For example, in case of an original image of 256X256 picture elements, if it is divided into 4X4 blocks, the block size is 64X64. The number of elements to satisfy CMAX.TH (predetermined threshold value) in C'(sub mn) and the predetermined number of picture elements are compared and decided which is larger, and when M>(the number of picture elements satisfying CMAX.TH), the block C'(sub mn) is Fourier transformed to obtain B'(sub xy). The absolute value of B'(sub xy) is taken to calculate the coordinate (x', y') of the maximum value. Further, the phase angle A in (x', y') is calculated.

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MEASUREMENT OF DC MAGNETIC FIELD

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ABSTRACT
PURPOSE: To measure a DC magnetic field at a high sensitivity and a high accuracy by detecting **distortion** of a **non- linear** magnetostrictive element with a Fabry-Perot interferometer made of an optical fiber wound around the element according to the DC magnetic field.

CONSTITUTION: A non-linear magnetostrictive element 10 to which an AC bias magnetic field is applied through a bias coil 14 is distorted greatly and deformed according to a DC magnetic field from an air core coil 26. This distortion is detected at a high sensitivity and a high resolution with a Fabry-Perot interferometer 16 made of an optical fiber wound around the element 10 and the DC magnetic field measured with a light receiving photomultiplier 20 and an oscilloscope 22 or a counter 24 or the like at a high sensitivity and high accuracy